A SIMULATION OF EOS MISR DATA AND GEOMETRIC PROCESSING FOR THE PROTOTYPING OF THE MISR GROUND DATA SYSTEM

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Abstract. A software system for the simulation of the Earth Observing System (EOS) Multi- angle Imaging Spectro Radiometer (MIS}<) push- broom imaging data is presented. This software system, named MISRSIM, is being used in the prototyping of the geometric processing element of the MISR ground data system. Geometric processing for MISR involves the removal of navigational (platform position and pointing) errors and the mapping of the nine–camera, unprojected push-broom data to a geolocated space-based projection. Simulated navigation data is supplied by the. EOS Project and is processed by software described in Ibis paper. In order to determine the intersection of the push-broom data with the Earth's surface, image rendering techiques are used. Software was obtained from the Digital 1 mage Animation Laboratory (1)1 AL) at JPL and has been modified to use the MISR nine camera models and platform ephemeris. To simulate the surface radiances received by the instrument, Landsat Thematic Mapper (TM) data are used. Digital elevation maps (DEMs) corresponding to each geolocated Landsat scene were obtained to calculate the surface intersection. Projection parameters which map the MISR nadir camera imagery to a geolocated reference are determined using supplied navigation data and the corresponding DEM. Projection parameters which map the off-nadir camera images to the nadir (i.e. rectification) are determined by employing image matching of imagery from pairs of cameras guided by the DEM. Errors in platform position and pointing knowledge can also be modeled by MISRSIM. The effect of these errors is measured by using the results of image matching between the. affected orbit data and a geolocated reference. The results obtained and the image matching schemes used are presented.